

## ***Pet Rock***

Nevada Division of Minerals

This activity teaches about geology. Students will become familiar with some characteristics of rocks. The activity develops the math skills of measuring, estimating, attributes, and Venn Diagrams, and the science skills of observing, predicting, gathering/recording data, and classifying.

### ***Materials Needed:***

Per Student:

Each student brings a rock to class

For Class:

Two or more metric rulers

Two or more scales with gram weights

Two or more copper pennies

Two or more steel nails

Water container

100 ml or less of vinegar

Eyedropper

Yarn for Venn Diagrams

Magnifying glasses (optional)

### ***Key Question Students Are to Explore:***

What characteristics make your rock unique among all the pet rocks in our class?

**Background Information — Rocks and Minerals:**

There are over 2,000 minerals in the earth, but ten of them form 99% of the earth's rocks. Geologists measure the hardness of minerals by giving them a number of one (soft) to ten (hard).

How are rocks and minerals different? Minerals are relatively pure and chemical formulas can be written for them. Rocks are usually a mixture of minerals. Some minerals, but not all, form rocks. Some of these rock-forming minerals are listed below.

Hardness Example	Scratch Test
1. talc (talcum powder)	fingernail scratches
2. gypsum (chalk, plaster of paris)	fingernail scratches
3. calcite (limestone)	copper penny scratches
4. fluorite	knife scratches
5. apatite	knife scratches
6. feldspar (granite)	metal file scratches
7. quartz (amethyst, agate, onyx)	scratches glass
8. topaz	scratches quartz
9. ruby, topaz	scratches topaz
10. diamond	scratches others, only scratched by diamond

Hardness of common materials: fingernail — 2.5; copper penny — 3.0; steel knife — 5.5-6.5.

**Kinds of Rock:**

*Sedimentary:* The word comes from Latin and means “settle”. Sediment such as sand, clay, and gravel can be cemented together by water pressure forming sandstone, shale, and conglomerates respectively. Sedimentary rock is also formed from living things such as plants (coal). A third formation is caused by chemical change (many forms of limestone). Fossils are common in sedimentary rock, particularly near the ocean.

*Igneous:* This group of rocks is formed from hot, liquid magma. Coarse grained rocks such as granite are produced by slowly cooling underground. The Sierra Nevada Mountains are granite. Others, such as basalt, obsidian, and pumice cool quickly on the surface.

*Metamorphic:* Rock that changes from its original form due to pressure, heat, gas, or water is called metamorphic. Crystals grow, bands of minerals may form, layering may develop, etc. Slate can develop from shale and marble from limestone.

***Activity Instructions:***

1. Ask each student to bring a rock bigger than their thumb and smaller than their fist. Encourage them to bring interesting and unusual specimens, perhaps collected on a vacation.
2. If possible, bring in samples of soft rocks, lava, and pumice for comparison.
3. Set up the following comparisons:
  - Length — metric rulers
  - Mass — scales and weights
  - Scratch — copper, pennies, nails
  - Vinegar — vinegar, eyedropper, paper towel
  - Float — water in container, paper towel
4. The top half of the worksheet will be done individually. After making predictions, student groups of four to five will move from center to center performing tests; some may need to wait until a center is available.
5. Day 1: Allow about 60 minutes to make predictions, gather data, and write descriptions.
6. Day 2: Allow 45-60 minutes for guessing game and Venn Diagrams.

## ***My Rock*** (Goes with “Pet Rock” Activity)

In this activity, students will experience that rocks have properties by which they can be described. The activity teaches the math skills of sorting and classifying, measurement - mass, measurement - length, and comparing. It also teaches the scientific processes of observing, comparing, recording data, and generalizing.

### ***Materials Needed:***

One rock per student  
Primer balances  
Teddy Bear counters  
String  
Rulers

### ***Key Question Students Are to Explore:***

What makes your rock special and easy to find when mixed with others?

### ***Background Information:***

Rocks are pieces of the earth's crust. Rocks can be classified into three groups based on how they were formed from hot liquid magma. Metamorphic rocks changed from their original form due to pressure, heat, gas, or water. Sedimentary rocks are formed when layers of mud, sand, gravel, and minerals settle out of water onto the ocean floor. Over many years these layers are pressed together and become solid.

### ***Preparation:***

1. Each student may bring to school a rock of his/her choice small enough to be easily carried in one's hands.
2. Teachers may provide a variety of rocks that show the three groups.
3. Several good children's books are available that invite children to be interested in rocks. Titles and authors are:  
Byrd Baylor — “Everybody Needs A Rock”  
Joanna Cole — “The Magic School Bus Inside the Earth”  
Bruce Hiscock — “The Big Rock”

### ***Procedure:***

1. Ask students to bring a rock to school — one they can easily carry in one hand.
2. Each student will draw and describe his/her rock.
3. Use a string to measure the length of each rock. Glue the string on the activity page.
4. Measure the distance around the rock with a string and glue this string length on the page.
5. Use Teddy Bear counters and Primer Balances to measure the mass of the rock.
6. Write a story about the rock.
7. Do selected activities from the eight task cards included with this lesson. These cards are designed for the teacher to use according to the abilities and interests of the students.

**Discussion Questions:**

1. If you placed your rock in a bag with five other rocks, how would you be able to find your rock?
2. What traits do rocks have that make it possible to group them together?

**Proportionality:**

Before students are asked to find the solution to percentage problems, they need sufficient experience in each of these steps. By breaking the entire procedure into its major components, the student is able to identify the essential steps and master each in turn. While this procedure may seem painstakingly slow, it builds a strong base of understanding. The result is that percentage problems lose their air of mystery. In the series of activities that follow, these steps will be developed and combined progressively until the process is complete.

**Procedure:**

1. Decide if students should round to the nearest cm or nearest half cm when measuring length.
2. Before handing out the worksheet, have students study their rocks and write down at least five observations. Optional — use a magnifying glass.
3. Scratch Test — A scratch is defined as a small crevice. Pressure should be applied. Traces of metal left on a rock are not scratches. Try the scratch test in this order: fingernail, penny, nail. See background information to relate to the scale of hardness.
4. Vinegar Test — Use an eyedropper to place a few drops of vinegar in a scratch or on the surface. If it bubbles, calcium carbonate found in limestone, marble, etc. is present.
5. Float Test — Place the rock gently in water and see if it will float. Try pumice, it will.

**What The Students Will Do:**

1. Bring a rock and give it a pet name.
2. Record answers on top half of worksheet. Then draw a side view of the rock.
3. Estimate length (cm) and mass (g).
4. Predict which material will scratch the rock and the results of the vinegar and float tests.
5. Travel from center to center in groups, measuring length/mass and doing the scratch, vinegar, and float tests.
6. Make a list in sentence or paragraph form describing the rock's characteristics. During the guessing game, evaluate whether the statements are complete and lead to identification.
7. Play a guessing game — Gather the rocks together and collect student descriptions. Slowly read their statements and see if the rock can be identified from the pile.
8. Venn Diagram — Make two yarn circles on the floor or table. Gather the class around and have them divide rocks by color, size, or other tests. Paper strips labeled smooth/rough; more than/less than 100 grams; one color/many colors; bubbles/doesn't bubble, etc.

**Discussion:**

1. Is your rock all one color? (Most rocks are formed from several minerals.)
2. Do you think there is any kind of rock that will float? (Pumice)
3. Were the rock descriptions clear and helpful? How would we improve our writing?
4. Compare your rock with a neighbor's. In what ways are they alike? Different?

**Extensions:**

1. Use rock identifying books along with data collected to determine whether the rock is sedimentary, igneous, or metamorphic.
2. Streak test — Scratch the rock against an unglazed porcelain tile (back of kitchen tile). Color will help determine minerals present. Find information on mineral colors.

**Curriculum Coordinates:****Language Arts**

1. Write directions for taking care of your pet rock.
2. Write a cartoon or story about your rock's adventures.
3. Read "Sylvester and the Magic Pebble" by William Steig.
4. Research ways rocks are used.

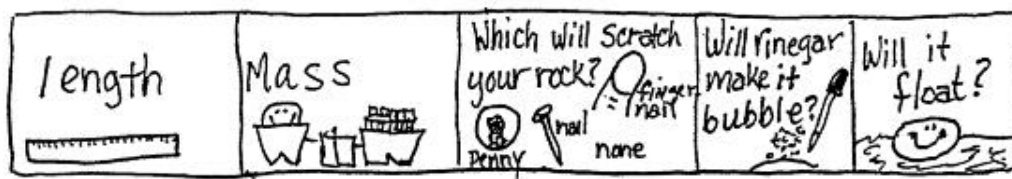
**Computer**

1. Create a simple data base on rock characteristics
2. Surf the internet to find information on rocks.

**Creative Thinking**

1. Make a list of new/interesting/unusual ways to use rocks.

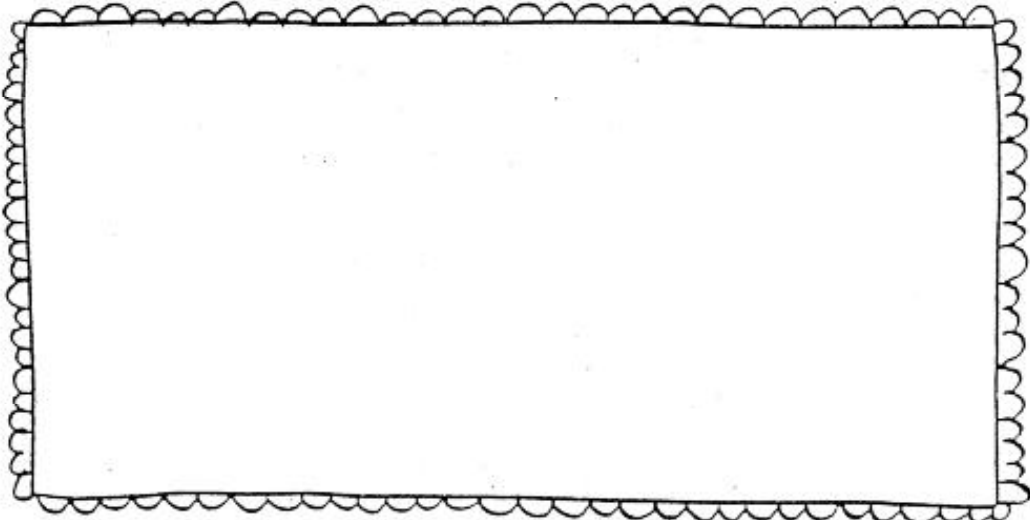
*NOTE: Worksheets and activity aids follow to copy and use for the class.*





# My Rock

Name: \_\_\_\_\_



This is a picture of my rock.

My rock's name is \_\_\_\_\_.

My rock is light or dark.


My rock is rough or smooth.

The colors in my rock are \_\_\_\_\_.

I love my rock.



# My Rock's Measurements

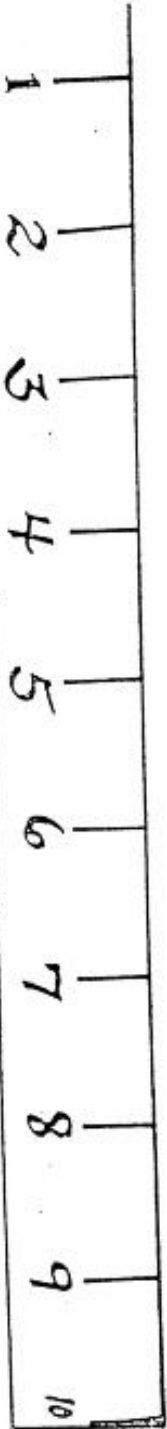
My rock is this long. 

(glue string here)

My rock is this big around. 

(glue string here)

My rock measures this many inches.



(Lay your rock on the ruler. Mark its length. Color it in.)

Name: \_\_\_\_\_

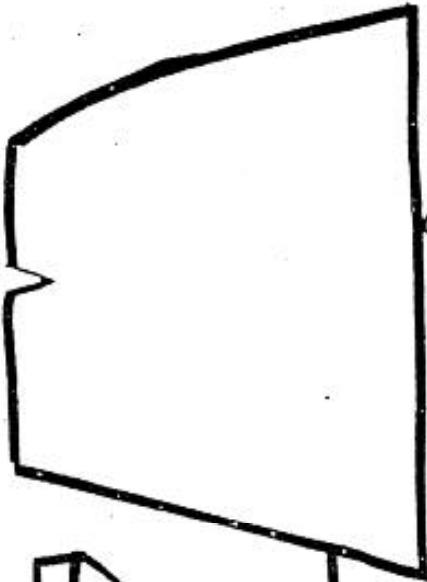
# My Rock Weighs



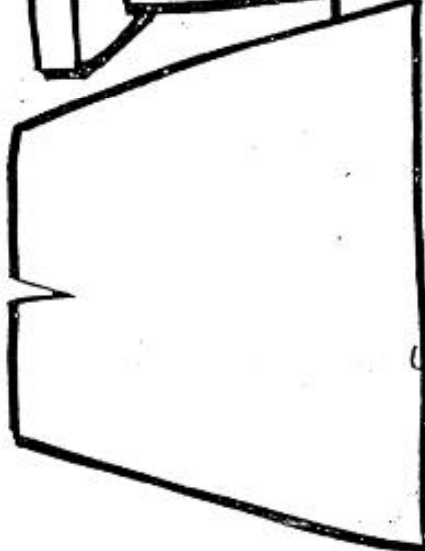
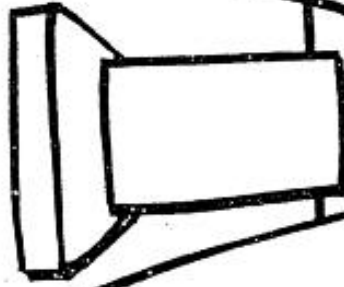
I think my rock will weigh \_\_\_\_\_

My rock weighed \_\_\_\_\_ Teddy Bears.

Draw your rock.



Draw the Teddy Bears



These are the colors of the Teddy Bears I counted.

\_\_\_\_\_ + \_\_\_\_\_  
green yellow

# My Rock's Story



Handwriting practice lines consisting of solid top and bottom lines with a dashed middle line. There are six sets of these lines for writing practice.

written by: \_\_\_\_\_




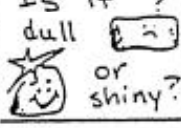
# ROCK 'N' RULE

## "How Are Rocks Different?"

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Directions:


Put one rock on each letter. Describe each rock by filling in the chart.

Rock	Color 	Color and shape of minerals	How does it feel? 	Does it have stripes? 	Is it dull or shiny? 
A					
B					
C					
D					
E					
F					

Now complete these sentences about your rocks. Describe each rock 2 ways.

- ① Rock A is \_\_\_\_\_
- ② I like Rock B because it's \_\_\_\_\_
- ③ The prettiest things about Rock C are \_\_\_\_\_
- ④ Rock D has \_\_\_\_\_
- ⑤ I collected Rock E because \_\_\_\_\_
- ⑥ I like Rock F because \_\_\_\_\_
- ⑦ My favorite rock is Rock \_\_\_\_\_ because \_\_\_\_\_

Rocky's Rock Award



Presented to \_\_\_\_\_

for: \_\_\_\_\_

Awarded this \_\_\_\_\_ day  
of \_\_\_\_\_, 19\_\_\_\_.

Teacher \_\_\_\_\_

Principal \_\_\_\_\_

## ***Rock Critters/Pet Rock***

### ***Rock Critters Activity:***

Children love to create rock critters! Have the children collect some rocks of different shapes and sizes. After you have a mountain of these rocks you can start.

### ***As the children create their critters have them:***

1. Join the stones together with small bits of cotton soaked in white glue.
2. Allow the pieces to dry thoroughly before adding new rocks to their critter.
3. Use small buttons, etc. for eyes, ears, etc. or paint them on.



### ***Pet Rock Activity:***

You can show the “Pet Rock” video (available through the Nevada Department of Minerals) and then have each child find a flat, medium-sized river rock.

### ***Instructions:***

1. Have students fill out the “Pet Rock” form describing their rock. Then collect all of the rocks and pass the forms to another student. See if another student can identify the rock using the form only.
2. Have students create a computer database of “Pet Rock” information.

